



Driving Scotland to an Electric Future

Alister Hamilton

Transition Black Isle, 7pm Tuesday 16th June 2020



Electric Vehicle Association Scotland

Scottish Government targets

2020: Generating 100% of Scotland's electricity demand from renewables.

2025: Phase out need for new petrol or diesel vehicles in Scotland's public sector fleet.

2032: Phase out the need for all new petrol or diesel cars and vans.

2035: Decarbonise Scotland's railways.

2040: Highlands and Islands the world's first net zero aviation region.

2045: Net zero carbon emissions.

About EVA Scotland



- Formed in 2011 by 7 electric vehicle drivers
- Became a non-profit Community Interest Company (CIC) in 2017
- Aims to be the voice of the electric vehicle movement all over Scotland
- Supports the electrification of all forms of transport
- Affiliated with AVERE (European Association for Electromobility)

Types of Electric Vehicle

What are the different types of electric vehicle?

A vehicle that can be powered in part or full by a battery that can be plugged into mains electricity. The main type are:

- Pure EV
- Plug-in hybrid
- Extended range EV

Little Red



2013 Nissan Leaf

24 kWh battery

2.3 kW charger

CHAdEMO rapid (journey) charger

58,500 miles

CHAdEMO: "CHArge de Move"

Second hand electric vehicles



Jonathan Porterfield

eco-cars.net

EVA Scotland member

2011 Nissan Leaf

24 kWh battery

67,850 miles

Price: £7,250

Skoda CITIGOe iV SE



36.8 kWh lithium ion battery

Range **up to** 170 miles

[3 to 5 miles per kWh of battery capacity]

Skoda CITIGOe iV SE: Charging



At home using a type 2 cable from an **approved**
2.3 kW domestic outlet

16 hours and 12 minutes to 100% SoC

At home using a 7 kW domestic EV charge point

5 hours 27 minutes to 100% SoC

Using a public journey (rapid) charger

1 hour to 80% SoC using CCS (40 kW DC)

SoC: state of charge

CCS: Combined Charging System

Domestic Charge Points



7 kW AC



Integrate with domestic solar or wind (tethered and untethered)

Ohme and Octopus Agile



At times of excess generation, **you may be paid to charge your car.**



A smart meter display showing electricity prices in p/kWh for various time intervals. The prices are listed in a table format with alternating blue and dark blue background rows.

00:00 - 00:30	1.66 p/kWh
00:30 - 01:00	3.61 p/kWh
01:00 - 01:30	3.15 p/kWh
01:30 - 02:00	1.32 p/kWh
02:00 - 02:30	0.42 p/kWh
02:30 - 03:00	0.42 p/kWh
03:00 - 03:30	0.42 p/kWh
03:30 - 04:00	0.04 p/kWh
04:00 - 04:30	1.89 p/kWh
04:30 - 05:00	2.08 p/kWh
05:00 - 05:30	4.20 p/kWh
05:30 - 06:00	5.54 p/kWh
06:00 - 06:30	5.67 p/kWh
06:30 - 07:00	6.51 p/kWh
07:00 - 07:30	7.46 p/kWh
07:30 - 08:00	8.00 p/kWh

Domestic charge point funding

- Office for Low Emission Vehicles (OLEV) funding: £500
- Energy Saving Trust (Scotland only): up to an additional £300
- Typical cost for home charge point and installation: £1,000
- OLEV accredited suppliers only
- All domestic electric vehicle charge points funded by EST must be 'smart'.

<https://energysavingtrust.org.uk/scotland/grants-loans/domestic-charge-point-funding>

Public Chargers: ChargePlace Scotland public network



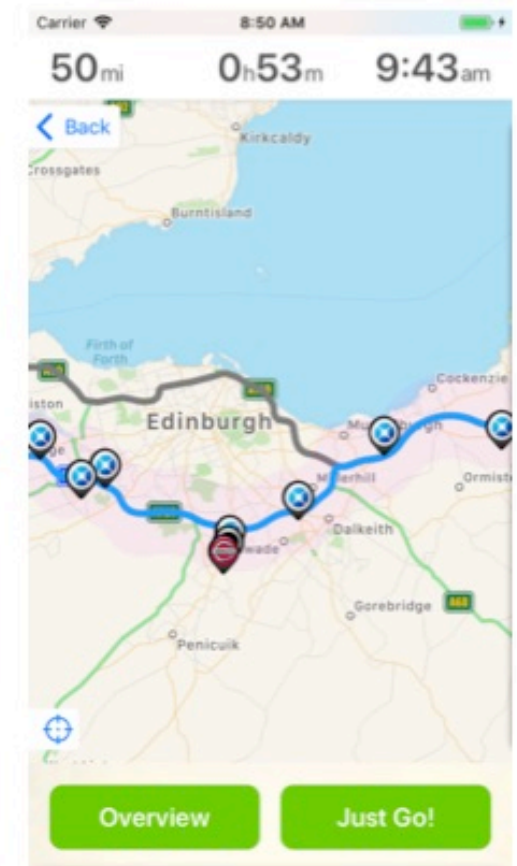
Destination (slow/fast) charger (7 kW / 22 kW AC)
Other charging networks are available e.g Tesla, InstaVolt etc



Journey (rapid) charger (50 kW DC, 43 kW AC)

Charging 'apps' and websites

- ChargePlace Scotland (<https://chargeplacescotland.org/>)
- WattsUp (available on iOS and Android)
- Zap-map (<https://www.zap-map.com/>)
- Plugshare (<https://www.plugshare.com/>)



Plug-in grant

- Available for a range of eligible electric vehicles including cars, vans, motorcycles, mopeds, taxis and even large trucks
- Emissions of less than 50 g/km and a zero emissions range of more than 70 miles
- Maximum grant available for **new** electric cars is £3,500
- Maximum grant for a **new** electric van is £8,000

Benefit In Kind

- Pure **electric** cars will pay no company **car** tax next year
- From 6 April **2020** until 5 April 2021, full battery **electric vehicles** (BEVs) will pay no **Benefit in Kind** rate. This compares to 37% at the opposite end of the emissions scale.

Vehicle Excise Duty (road tax)

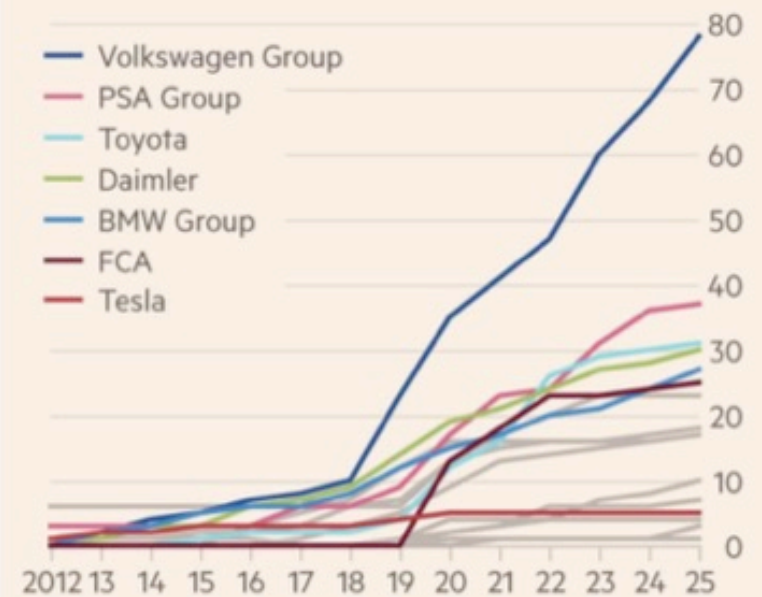
Road tax, officially known as Vehicle Excise Duty (VED), is calculated based on the CO₂ tailpipe emissions of your vehicle, its list price and which year it was registered in.

- Pure battery electric vehicles (BEVs) are exempt from VED.
- Plug-in hybrid electric vehicles (PHEVs) pay reduced VED.
- Any vehicle (including BEVs) with a list price of £40,000 or above will incur an additional premium rate for the first 5 years.

Manufacturers to watch ...

The range of electric vehicle models is increasing

Number of new EV models in Europe



Source: Transport & Environment
© FT



MG ZS EV (£21,995 or £264 pcm)

0-62 mph	Top Speed	Range	Efficiency
8.2 s	87 mph	145 miles	305 Wh/mile
Rapid charging		Front wheel drive, seats 5	



Volkswagen ID.3 (£22,000 or £270 pcm)

0-62 mph	Top Speed	Range	Efficiency
8 s	99 mph	170 miles	260 Wh/mile
Rapid charging		Rear wheel drive, seats 5	



Nissan Leaf (£26,435 or £333 pcm)

0-62 mph	Top Speed	Range	Efficiency
7.9 s	89 mph	135 miles	265 Wh/mile
Rapid charging		Front wheel drive, seats 5	



Vauxhall Corsa e (£26,490 or £326 pcm)

0-62 mph	Top Speed	Range	Efficiency
8.1 s	93 mph	180 miles	260 Wh/mile
Rapid charging		Front wheel drive, seats 5	



Tesla Model 3 Standard Range (£34,000 or £425 pcm)

0-62 mph	Top Speed	Range	Efficiency
5.9 s	130 mph	195 miles	235 Wh/mile
Rapid charging		Rear wheel drive, seats 5	



BMW i3s 120 Ah (£34,170 or £491 pcm)

0-62 mph	Top Speed	Range	Efficiency
6.9 s	99 mph	140 miles	270 Wh/mile
Rapid charging		Rear wheel drive, seats 4	



Kia e-Niro 64 kWh (£34,495 or £425 pcm)

0-62 mph	Top Speed	Range	Efficiency
7.8 s	104 mph	235 miles	270 Wh/mile
Rapid charging		Front wheel drive, seats 5	



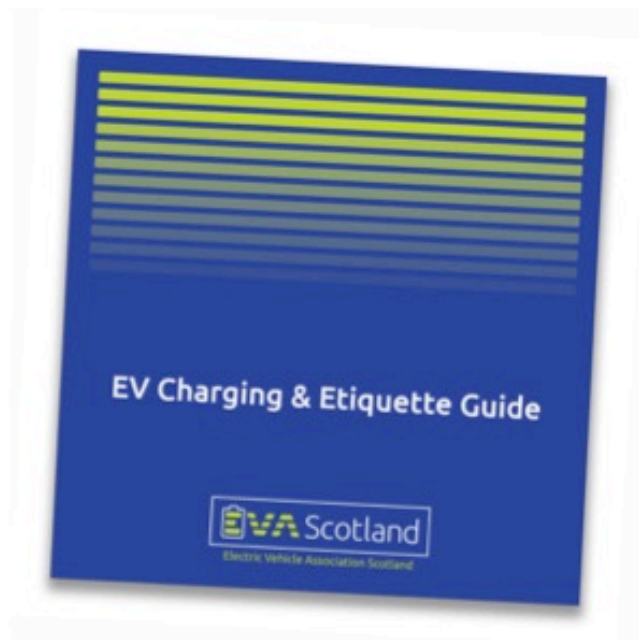
Hyundai Kona Electric 64 kWh (£35,100 or £425 pcm)

0-62 mph	Top Speed	Range	Efficiency
7.9 s	104 mph	245 miles	260 Wh/mile
Rapid charging		Front wheel drive, seats 5	

EVA Scotland membership pack and contents



EV Charging & Etiquette Guide



There are many issues for a new EV driver to come to terms with, one of the most significant being “fuelling” the vehicle.

Behaviours relating to charging and public charging in particular require driver education to ensure good practice, mutual understanding and respect.

EV Charging & Etiquette Guide

Charger recognition guide

Rapid or Journey Chargers

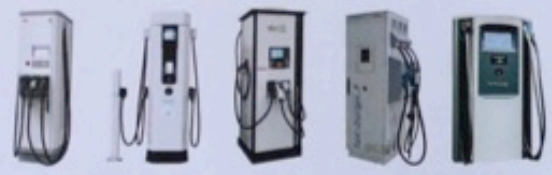
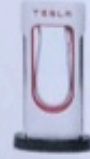



ABB DBT eVOLT Siemens ChargeMaster

Tesla




Tesla Supercharger

CCS and Type 2



Type 2 is a D shaped plug which has 7 pins. The Combined Charge System, CCS, has two additional DC pins. The plugs are locked in place while charging.

Chademo plug types



The Chademo plug design has improved over time, but there are a number of types. The more recent ones use a simple thumb latch and can be operated with one hand. The older ones can be daunting, but are gradually being replaced. They need two hands, requiring a bit of pressure pushing into the socket while squeezing the button to release the latch. The lever doesn't always drop on its own. Most users have had tricky moments with these, so don't be afraid to ask others for help.

Charge terms


Mode 2: Uses an inline "brick" with a domestic plug at one end and a car plug at the other. The "granny charger", good for 10 amps wherever you can plug in - **Slow**.

Mode 3: A dedicated AC supply device, with all the electronics onboard. In Europe this is usually a socket, but can also be tethered with a built-in cable. Sockets can be up to 32 amps, tethered up to 250 amps - **Slow, Fast** and **Fastest**.

Mode 4: An external charger, with a tethered cable up to 400A DC - **Fastest**.

Cable care

EV charging cables are very robust. You should NEVER use them coiled up, it may look tidy, but it is potentially dangerous. Once connected, loosely tuck excess under the car to keep it dry and out of the way. When not in use make sure any dust covers are in place on plugs and sockets, then store the cable in a protective bag.



Web resources and interest:

www.eva.scot www.fullychargedshow.co.uk
www.chargeplacescotland.org www.autovolt-magazine.com

EVA Scotland Charging Disc



Controlled communication between a driver seeking a charge and the driver of a vehicle left charging at a public charge point can relieve stress and facilitate informed recharging decisions.

Visible end of charging time estimation.

Text short code messaging service.

Two way controlled communication.

Messages controlled by EVA Scotland.

EVA Scotland Annual General Meeting



The 2018 AGM was held in Glasgow.

EVA Scotland were honored to welcome Scottish Government Minister for Transport and the Islands, Humza Yousaf MSP, to provide the keynote address.

Humza Yusaf became our first honorary member.

The 2019 AGM was in Dundee, the 2020 AGM was due to be in Musselburgh on 28th March, but was virtual.

EVA Scotland Newsletter, website and forum (eva.scot)



The screenshot displays the 'April News' newsletter from the Electric Vehicle Association Scotland. The header features the EVA Scotland logo and the title 'April News'. The main content includes an 'AGM Report' detailing the annual general meeting held at Glasgow's City Hall, attended by members from various organizations like Transport Scotland and BWM Energy. A 'Make EVAS Local' section encourages members to form local EVAS groups. A 'Meet the Directors' section introduces the new team, including Dr. Alister Hamilton, Douglas Robertson, and Robert Smith. The newsletter also features a 'Charging of EVs in the UK' article and a 'New EVAS Local' announcement. The layout is clean and professional, with a blue and white color scheme.

EV Promotion: EV Roadshow, Perth Racecourse, 22nd September 2018



EV Promotion: EVOLUTION, Riverside, Glasgow, 6th October 2018



Electrifying Conversations Roadshow, New Zealand, Nov. 2019



Networking



EVA Scotland seek to represent members interests and learn from the wider community.

Networking with other EV associations allows us to share best practice and learn from each other.

In particular we have excellent relationships with the Norwegian EVA, Norsk Elbilforening.

EVA Scotland membership of AVERE



AVERE General Assembly, October 2019

EVA Scotland membership of AVERE



EVA Scotland nominated Dundee for the E-Visionary Award Europe.

The E-Visionary Award is presented by the World Electric Vehicle Association (WEVA) to cities and regions across the globe for initiatives to promote electric vehicles as a sustainable mode of transportation, and for making electric mobility a reality for the citizens of their regions.

Dundee won the European award!

Other winners were New York and Kobe, Japan.

Award presented at EVS31 in Japan, 3rd October 2018.

For more information:

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